

DO NOT OPEN THIS TEST BOOKLET TILL YOU ARE ASKED TO DO SO.

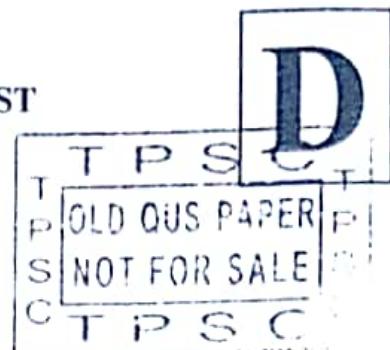
TR/DLPI/EE/II/D/14

Test Booklet Series

**TEST BOOKLET
GENERAL ABILITY TEST
PART-II**

(Signature of the Candidate)

(Invigilator's Signature)



Time allowed : 1 hour 30 mins (One hour & thirty mins)

Maximum Marks - 60

INSTRUCTIONS

1. IMMEDIATELY AFTER THE COMMENCEMENT OF THE EXAMINATION, YOU SHOULD CHECK THAT THIS TEST BOOKLET DOES NOT HAVE ANY UNPRINTED OR TORN OR MISSING PAGES OR ITEMS ETC. IF SO, GET IT REPLACED BY A COMPLETE TEST BOOKLET.
2. ENCODE CLEARLY THE TEST BOOKLET SERIES IN THE APPROPRIATE PLACE IN THE ANSWER SHEET BY BLACK BALL POINT PEN ONLY.
3. This Test Booklet contains 60 items (questions). Each question, carrying 1 (one) mark only, has four responses (answers). You will select the response which you want to mark on the Answer Sheet. In case you feel that there is more than one correct response, mark the response which you consider the most appropriate. In any case, choose ONLY ONE response for each item.
4. You have to mark all your responses by Black Ball Point Pen only on the separate Answer Sheet provided. See directions in the Answer Sheet.
5. All items carry equal marks.
6. Before you proceed to mark in the Answer Sheet the responses to various items in the Test Booklet, you have to fill in some particulars in the Answer Sheet as per instruction sent to you with your Admission Certificate.
7. After you have completed filling in responses on the Answer Sheet and the examination is completed, you should hand over the Answer Sheet to the Invigilator only. You are permitted to take the Test Booklet with you.
8. Sheets for rough work are appended on the Test Booklet at the end.
9. **Penalty for wrong answers :**
 - (i) For each question for which a wrong answer / multiple answer has been given by the candidate, a $\frac{1}{4}$ (half) mark will be deducted as penalty.
 - (ii) If a question is left blank, i.e. no answer is given by the candidate ; there will be no penalty for that question.

DO NOT OPEN THIS TEST BOOKLET TILL YOU ARE ASKED TO DO SO.

Four options are given against each of the following questions. Select the best / correct option from among the four options and encode in the answer sheet by using **Black Ball Point** only as per example given below :

Example : The wheel in our National Flag has

- | | |
|---------------|---------------|
| (a) 20 spokes | (b) 24 spokes |
| (c) 30 spokes | (d) 25 spokes |

Answer : (a) (c) (d)

1. A circuit with a resistor, inductor capacitor in series is resonant of frequency f_0 Hz. If all the component values are now doubled, then the new resonant frequency will be

(a) $2f_0$	(b) still f_0
(c) $\frac{f_0}{4}$	(d) $\frac{f_0}{2}$
2. How many 200W/ 220V incandescent lamps connected in series would consume the same total power as a single 100W/220V incandescent lamp ?

(a) not possible	(b) 4
(c) 3	(d) 2
3. For a two port network to be reciprocal

(a) $Z_{11} = Z_{22}$	(b) $Y_{21} = Y_{12}$
(c) $h_{21} = + h_{12}$	(d) $AD - BC = 0$
4. A sin wave voltage is applied across a capacitor. When the frequency of the voltage is increased, the current through the capacitor

(a) increases	(b) decreases
(c) remains the same	(d) is zero
5. The rms value of the resultant current in a wire which carries a DC current of 10A and a sinusoidal alternating current of peak value 20A is

(a) 14.1 A	(b) 17.3 A
(c) 22.4 A	(d) 30.0 A
6. Which of the following single phase motor has highest starting torque ?

(a) Split phase motor	(b) Shaded pole motor
(c) Capacitor start motor	(d) Repulsion motor

7. In a shaded pole motor, shading coils are used to
(a) reduce winding losses
(b) reduce friction losses
(c) produce rotating magnetic field
(d) to protect against sparking.
8. A 440V shunt motor has an armature resistance of 0.5Ω and shunt field resistance of 650Ω . If the no load current is 3A, then current in the armature will be
(a) 2.32 A
(b) 3A
(c) 0.68 A
(d) 880 A
9. The type of single phase induction motor having the highest power factor at full load is
(a) shaded pole type
(b) split phase type
(c) capacitor start type
(d) capacitor run type
10. An electric motor with 'constant output power' will have a torque-speed characteristic in the form of a
(a) straight line through the origin
(b) straight line parallel to the speed axis
(c) circle about the origin
(d) hyperbola
11. A hydraulic turbine having rated speed of 250 rpm is connected to a synchronous generator. In order to produce power at 50 Hz, the number of poles required in the generator are
(a) 6
(b) 12
(c) 16
(d) 24
12. A hollow conductor is at a potential V. The potential at any point inside the hollow is
(a) Zero
(b) $\frac{V}{2}$
(c) 2V
(d) None of these
13. A 100 km long transmission line is loaded at 110 KV. If the loss of line is 5 MW and the load is 150 MVA the resistance of the line is
(a) $0.806 \Omega/\text{phase}$
(b) $8.06 \Omega/\text{phase}$
(c) $0.0806 \Omega/\text{phase}$
(d) $80.6 \Omega/\text{phase}$
14. In a nuclear reactor, chain reaction is controlled by introducing
(a) iron rods
(b) cadmium rods
(c) graphite rods
(d) brass rods

15. The main criterion for selection of the size of distributors for a radial distribution system is
- voltage drop
 - corona loss
 - temperature rise
 - capital cost.
16. A meter has a full scale of 90° at current 1A. This meter has perfect square law response. What is the current when the deflection angle is 45° ?
- 0.5 A
 - 0.25 A
 - 0.707 A
 - 0.67 A
17. Electrostatic instruments are normally used for
- low current measurements
 - high current measurements
 - low voltage measurements
 - high voltage measurements
18. Q meter is used to measure
- current
 - voltage
 - power
 - quality factor
19. Inductance is measured by
- Wein's bridge
 - Schering's bridge
 - Maxwell's bridge
 - Owen's bridge
20. An oscilloscope indicates
- peak to peak value of voltage
 - DC value of voltage
 - rms value
 - average value
21. Choppers are used to
- convert AC voltage
 - DC voltage to variable DC
 - convert current to voltage
 - All of the above.
22. When transformer winding suffers a short-circuit, the adjoining turns of the same winding experience
- an attractive force
 - a repulsive force
 - no force
 - None of these.
23. As the load on transformer is increased, the core losses
- decrease slightly
 - increase slightly
 - remain constant
 - may decrease or increase slightly depending upon the nature of load.

24. Laplace transform analysis gives

- (a) time domain response only
- (b) frequency domain response only
- (c) Both (a) and (b)
- (d) None of the above.

25. The Maxwell equation $\vec{\nabla} \times \vec{H} = \vec{J} + \frac{\partial \vec{D}}{\partial t}$ is based on

- (a) Ampere's law
- (b) Coulomb's law
- (c) Gauss's law
- (d) Faraday's law

26. The unit of $\vec{\nabla} \times \vec{H}$ is

- (a) Ampere
- (b) Ampere / meter
- (c) Ampere / m^2
- (d) Ampere-meter

27. The Maxwell equation $\vec{\nabla} \cdot \vec{B} = 0$ indicates that

- (a) Electric quadropole does not exist
- (b) Electric monopole exist
- (c) Magnetic monopole exist
- (d) Magnetic monopole does not exist.

28. A clamp

- (a) preserves the signal shape but changes the DC level
- (b) changes the signal shape but preserves the DC level
- (c) preserves the signal shape as well as DC level
- (d) changes the signal shape as well as DC level.

29. Negative current feedback

- (a) increases output impedance
- (b) decreases input impedance
- (c) increases bandwidth
- (d) All of the above.

30. The scale of a voltmeter is uniform. Its type is

- (a) moving iron
- (b) induction
- (c) moving coil permanent magnet
- (d) moving coil dynamometer

31. The colour code of $1K\Omega$ resistance is

- (a) black, brown and red
- (b) red, brown and brown
- (c) brown, black and red
- (d) black, black and red

32. A bridge rectifier require

- (a) two diodes
- (b) four diodes
- (c) six diodes
- (d) eight diodes

33. A megger is an instrument used for measuring

- (a) very high voltage
- (b) very low voltage
- (c) very low resistance
- (d) very high resistance

34. If $\oint \vec{A} \cdot d\vec{l} = 0$ then, A is called

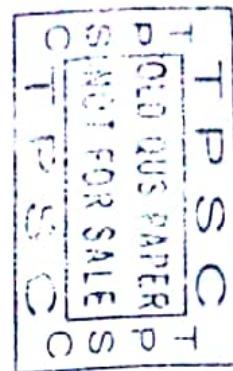
- (a) conservative field
- (b) harmonic field
- (c) vortex field
- (d) irrotational field

35. The ratio of resistance of 200W, 230V lamp to that of a 100W, 115V lamp will be

- (a) 0.5
- (b) 2
- (c) 4
- (d) 0.25

36. Three elements having conductance G_1 , G_2 and G_3 are connected in parallel, their combined conductance will be

- (a) $(G_1 + G_2 + G_3)^{-1}$
- (b) $G_1 + G_2 + G_3$
- (c) $\frac{1}{G_1} + \frac{1}{G_2} + \frac{1}{G_3}$
- (d) $\left(\frac{1}{G_1} + \frac{1}{G_2} + \frac{1}{G_3} \right)^{-1}$



37. Loss that occur in magnetic core of transformer

- (a) copper loss
- (b) iron loss
- (c) stray loss
- (d) dielectric loss

38. The highest speed at which 50 Hz alternator can operate

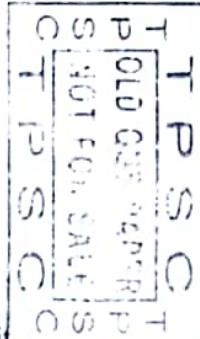
- (a) 6000 rpm
- (b) 3000 rps
- (c) 3000 rpm
- (d) None of the above.

39. In a transistor amplifier the _____ junction is reverse biased.

- (a) collector base junction
- (b) emitter base junction
- (c) CE base junction
- (d) collector emitter junction

40. In a three phase system, when the loads are perfectly balanced, the neutral current is
- one-third of maximum
 - maximum
 - two-thirds of maximum
 - zero
41. A coil has an inductive reactance of 4 ohm and a resistance of 3 ohm, the admittance of the coil is
- $(3 + j4)$ mho
 - $(0.12 - i 0.16)$ mho
 - $(0.6 - j 0.8)$ mho
 - $(3 - j4)$ mho
42. The capacitance effect of short transmission line is
- negligible
 - high
 - same as medium transmission line
 - same as long transmission line
43. Star-delta method of starting of motor is not possible in case of
- high speed motor
 - low horse power motor
 - single phase induction motor
 - high torque motor
44. A 3ϕ induction motor can also be referred to as a
- asynchronous motor
 - transformer
 - repulsion motor
 - shunt motor
45. For starting a DC motor a starter is required because
- it limits the speed of the motor
 - it limits the starting current to a safe value
 - it starts the motor
 - None of the above.
46. Magnetic field in a DC generator is produced by
- electromagnet
 - permanent magnet
 - both (a) and (b)
 - None
47. In a DC generator, lap winding is used for
- high voltage, high current
 - low voltage, high current
 - high voltage, low current
 - low voltage, low current

48. Permeance is the reciprocal of
 (a) flux density
 (b) reluctance
 (c) ampere turns
 (d) resistance
49. Which circuit element will oppose the change in circuit current ?
 (a) Resistance
 (b) Inductance
 (c) Capacitance
 (d) All of the above.
50. The 2's complement of -17 in six bit system is
 (a) 101111
 (b) 110001
 (c) 101110
 (d) . 111110
51. An op-amp comparator circuit employs
 (a) no feedback
 (b) +ve feedback
 (c) - ve feedback
 (d) both (b) and (c)
52. Counter is a
 (a) sequential circuit
 (b) combinational circuit
 (c) both
 (d) None.
53. In CRO sawtooth voltage is applied at the
 (a) vertical deflecting plates
 (b) accelerating anode
 (c) cathode
 (d) horizontal deflecting plates
54. In which braking back emf exceeds supply voltage ?
 (a) Dynamic
 (b) Plugging
 (c) Regenerative
 (d) None of the above.
55. Which of the following motor is used in grinder ?
 (a) Capacitor start induction motor
 (b) Capacitor start capacitor run induction motor
 (c) Split phase induction motor
 (d) Synchronous motor
56. Schering bridge is used to measure
 (a) capacitance
 (b) frequency
 (c) resistance
 (d) inductance



57. Which of the following is not the distribution system normally used ?
- (a) 1 phase 5 wire system
 - (b) 3 phase 3 wire system
 - (c) 1 phase 3 wire system
 - (d) 3 phase 4 wire system
58. Air core coils are practically free from
- (a) hysteresis losses
 - (b) eddy current losses
 - (c) friction losses
 - (d) both (a) and (b)
59. Armature reaction in DC generators will result in
- (a) increase in slip
 - (b) short circuit
 - (c) reduction in generated emf
 - (d) open circuit
60. The oil used in the transformer serves as a
- (a) insulator
 - (b) coolant
 - (c) both (a) and (b)
 - (d) None.